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SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
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EXAMINER	
NGUYEN, T	
ART UNIT	PAPER NUMBER
2309	5

DATE MAILED: 12/10/96

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents

Office Action Summary

Application No.
08/458,479

Applicant(s)
Belgard, Richard

Examiner
Than Nguyen

Group Art Unit
2309



☒ Responsive to communication(s) filed on Oct 10, 1996

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-37 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-37 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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Part III DETAILED ACTION

Claim Rejections - 35 U.S.C. § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crawford et al(US 5,321,836).

3. **As to claims 1,7,8:**

Crawford discloses a virtual memory management method and apparatus using segmentation and optional, independent paging mechanism. He discloses a data path for receiving a virtual address, including a segment identifier and offset. The segment descriptor memory stores the base address & limit of the physical address(See Figures 2 & 3). He stores the page frame information in the main memory(Figure 3, column 5 lines 39+). It would be

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also be obvious to one of ordinary skills in the art to store the page frame information in the segment descriptor memory so that the address translation process can be expedited. Having the page frame information in the segment descriptor, and not having to search for it, would obviously speed up the address translation.

4. As to claims 2,3,14,19,29:

Crawford discloses the segment memory being a plurality of registers(Abstract, column 4 line 35+). He also discloses that the descriptor memory could be cache memory(column 5 line 12+).

5. As to claims 4,5,6,16,24,32,37:

Crawford teaches the physical address register storing a physical address comprising of a page frame and offset(Figure 4). It is also noted that Applicant's Figure 1 also teaches this claim limitation. The resulting physical address is used to access physical memory(column 1 line 24, column 3 line 35+). He teaches using a 4 bit attribute field as information describing if the page can be used for translation(column 5 lines 28-38).

6. As to claims 9,18,20,26,30,31,34:

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Crawford discloses a virtual memory management method and apparatus using segmentation and optional, independent paging mechanism. He teaches the segmentation unit for generating linear addresses and storing the physical address information having offset(columns 1-2 lines 60-8) and main memory for storing the page frame information(Figure 3, column 5 lines 39+). It would be also be obvious to one of ordinary skills in the art to store the page frame information in the segment descriptor memory so that the address translation process can be expedited. Having the page frame information in the segment descriptor, and not having to search for it, would obviously speed up the address translation. He also discloses a paging unit for generating a physical address information having page frames and offsets. He discloses a data path for receiving a virtual address, including a segment identifier and offset. The segment descriptor memory stores the base address, limit, and page frame of the physical address(See Figures 2 & 3). The physical address is used to access physical memory(column 1 line 24, column 3 line 35+). Crawford uses a bus interface for performing memory accesses(Figure 1, column 4 lines 20+).

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7. As to claims 17,25,33:

Crawford discloses using a displacement field to generate the linear address(column 25 line 30+).

8. As to claims 10,21,27,35:

Crawford does not teach the comparator to compare the first and second page frame and canceling the memory access if they are not equal. He does uses a comparator to compare the offset with the segment limit to determine if the address to be generated will be valid(column 3 line 34+). It would be obvious to one in the art to use Crawford's teachings to use a comparator to compare calculated physical addresses to determine their validity since Crawford also teaches determining whether the address will be valid.

9. As to claims 11,12,22,28:

Crawford supplies the physical offsets to determine the physical addresses. Therefore, he does not teach generating the physical address offset from adding the virtual address offset with the segment base. He does teaches using virtual address offsets and segment base(Column 3 lines 25+). It would be obvious to one in

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the art to generate the physical offset by adding the virtual offset and the segment base, if the physical offset is not provided.

10. As to claims 13,15,23,36:

Crawford does not use a cache for storing the most recently used physical pages. Such cache for recently used data is commonly used in the art to provide for faster look-up. It would be obvious to one in the art to use a cache for recently used pages so that the process of looking up the translation information is accelerated.

Response to Amendment

11. Acknowledgment is made of the amendment, filed 10/10/96, which is made of record.

12. In response, the Examiner withdraws the objection to the title.

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Response to Arguments

13. Applicant's arguments with respect to claims 1-37 have been considered but are moot in view of the new ground(s) of rejection.

14. In response to the arguments, the Examiner has described the obviousness/advantage of having the page frame information in the segment descriptor memory in the claims rejection.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US patent 5,423,014.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Than Nguyen whose telephone number is (703) 305-3866.

17. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-9600.

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David A. Moore

DAVID A. MOORE
SUPERVISORY PATENT EXAMINER
GROUP 260

Than Nguyen

December 7, 1996